Imperial College London

MAG Data Release Report 2210

22 May 2023 (report covers data release for 1 October – 3 November 2022)

Report Version	1	L2 ground processing software version:	V2.24/V2.25
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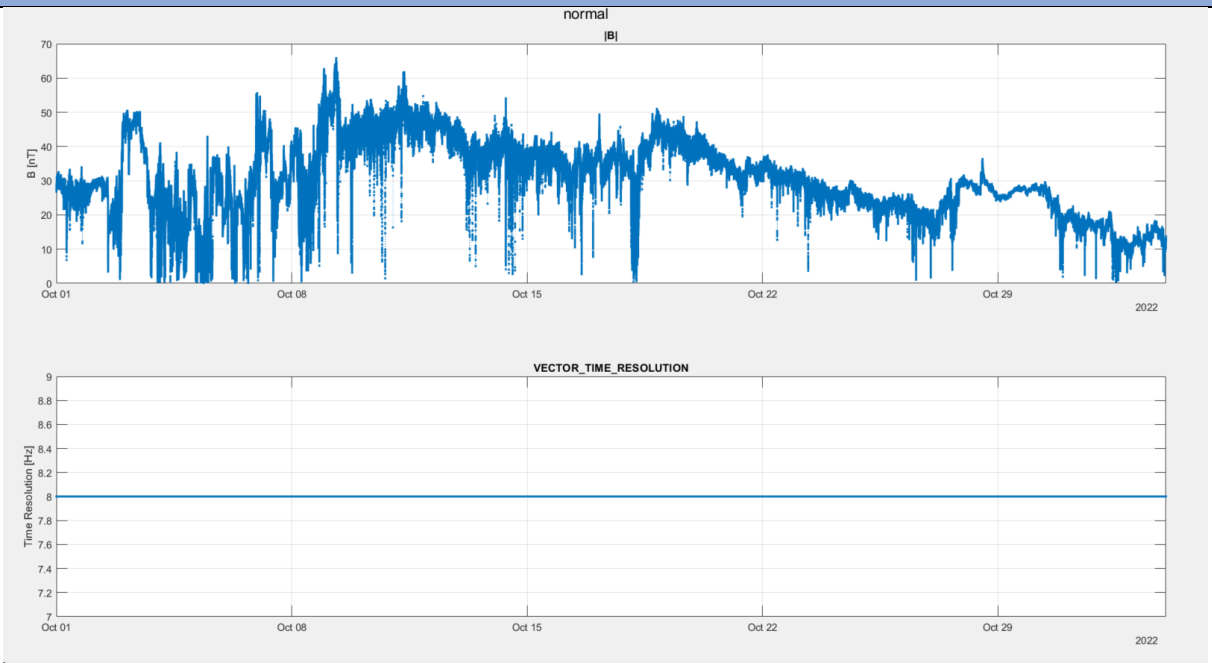
Data Summary

MAG was on for the period 1 October – 3 November 2022. MAG was turned off on the 3rd of November, which is the reasoning behind releasing the data up this date. BM is available through the month at a minimum of 64 vectors per second, with BM for 1 hour per day at 128 vectors per second on 25th and 27th to the 31st.

Perihelion was on the 12th of October.

The spacecraft started the month at 0.32AU and on the 3rd of November it was at 0.52AU from the Sun.

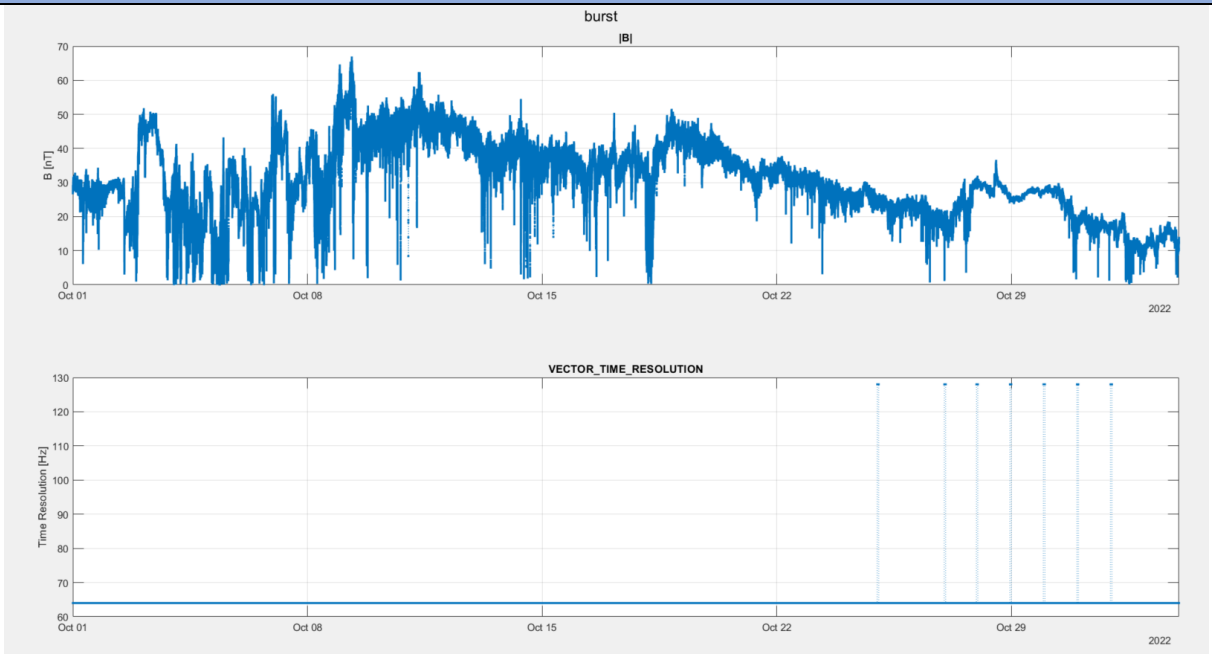
Normal Mode



Operations	1-30 September	Science phase throughout period, normal data produced.
Operational Events of Note	Perihelion 12/10.	

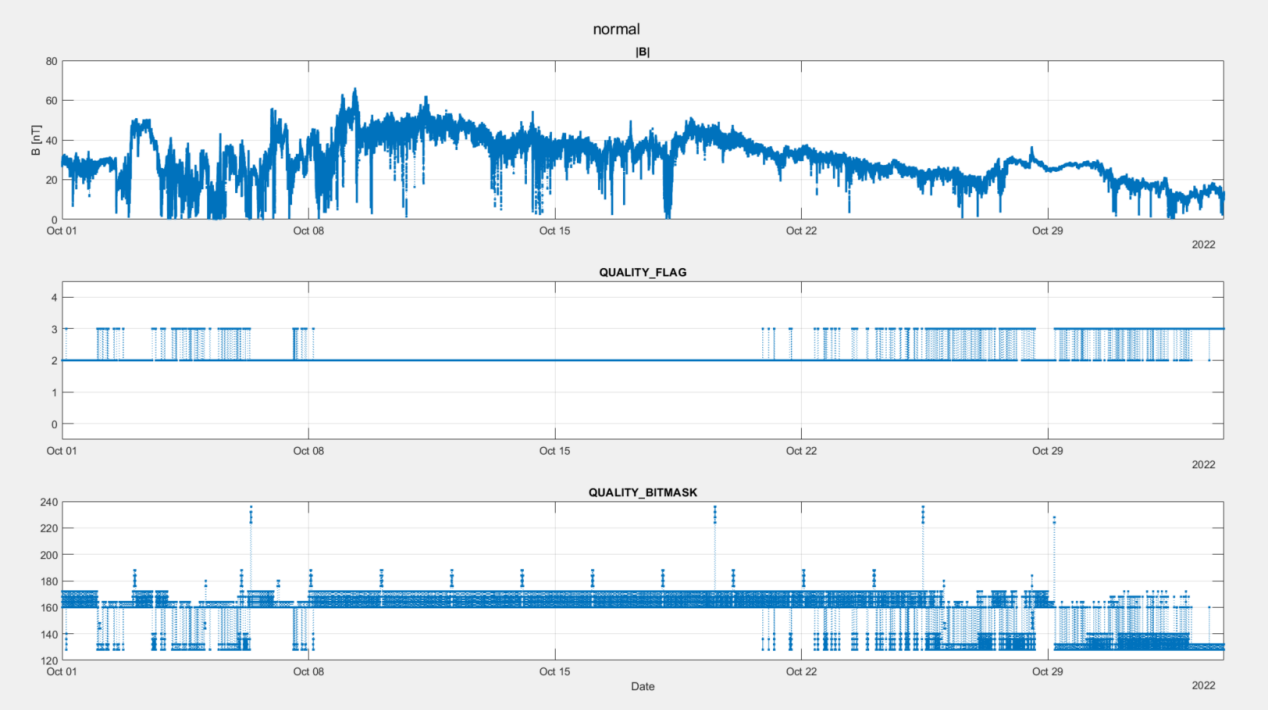
Normal mode data is produced from the burst mode stream when it is available. This can produce small changes in the time sampling of the data over the transition; these are smaller than the cadence of 1/8 of a second.

Burst Mode



Coverage	From	To	Coverage
	01/10	25/10	24h of 64 vectors/s
	25/10	25/10	23h of 64 vectors/s, 1hr of 128 vectors/s
	26/10	26/10	24h of 64 vectors/s
	27/10	31/10	23h of 64 vectors/s, 1hr of 128 vectors/s

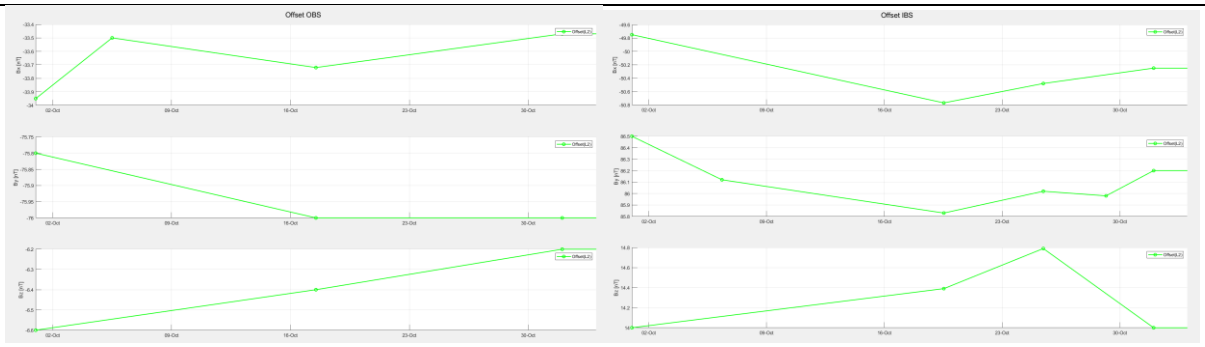
Quality bitmask



Quality bit mask events	
SC events which disturb the field	1. Solar array movements (solar array angle is changed, and then remains at new angle due to sun-SC distance thermal constraints) 2. High gain antenna movements
SC related issues	

Time	Reason
05/09/2022 22:44 -22:45	SA movement from 55.91 to 59.96 deg
02/09/2022 21:29 - 21:39	HGA movement -161.6 to -169.0 azimuth angle
04/09/2022 05:39 - 05:44	HGA movement -169.0 to -170.3 azimuth angle
08/09/2022 04:54 - 05:04	HGA movement -170.3 to 162.2 azimuth angle
19/09/2022 03:38 - 03:40	SA movement from 59.96 to 70.02
26/09/2022 17:11 - 17:12	SA movement from 70.02 to 72.98
30/09/2022 10:42 - 10:43	SA movement from 72.98 to 76.91

Offsets



1 Oct – 3 Nov:
The OBS offset followed a mostly linear trend throughout the month, across perihelion. The IBS offsets change on the 6th, 19th, 25th and 29th due to solar array (SA) movement. Between these events, the offset linearly changed, and the trend has been chosen accordingly.

Offset Number	Date	OBSX	OBSY	OBSZ	IBSX	IBSY	IBSZ	Comment
220919	01/10/2022 00:00	-33.95	-76	-6.6	-49.8	87	14	Offset at start of month
220920	05/10/2022 12:00	-33.5						Correction to OBS X
220921	06/10/2022 08:29					86		SA movement 76 to 79 (impact on IBS)
220922	17/10/2022 12:00	-33.7	-76	-6.4				Linear trend in OBS X,Y,Z
220923	19/10/2022 12:50				-50.8	86	14.39	SA movement 79 to 77 (impact on IBS)
220924	25/10/2022 10:39				-50.5	86	14.79	SA movement 77 to 73 (impact on IBS)
220925	29/10/2022 04:10					86		SA movement 73 to 70
220926	31/10/2022 23:59	-33.5	-76	-6.2	-50.3	86	14	Linear trend in OBS X,Y,Z
220927	03/11/2022 11:21	-33.5	-76	-6.2	-50.3	86	14	MAG OFF

Residual MAG heater signal in data

Interference from the MAG heater is routinely characterised and removed from the data. Users should be aware that periodic signals of ~15minute period in the data, could be attributed to the MAG heater, and so users should check for correlation to the MAGHEATERON flag in the quality bitmask. This may be particularly prevalent at times of a lower natural signal. The magnitude of this error in the released archive data will be less than +/-0.2nT.
Heater characterisation is particularly challenging near perihelion or when the sensor thermal environment changes. There is some visible heater signal, particularly in the magnetic field magnitude, during the 29th and 30th of October.

Appendix

Appendix A: Files within this release

File Name
solo_L2_mag-rtn-burst_20221001_V01.cdf
solo_L2_mag-rtn-burst_20221002_V01.cdf
solo_L2_mag-rtn-burst_20221003_V01.cdf
solo_L2_mag-rtn-burst_20221004_V01.cdf
solo_L2_mag-rtn-burst_20221005_V01.cdf
solo_L2_mag-rtn-burst_20221006_V01.cdf
solo_L2_mag-rtn-burst_20221007_V01.cdf
solo_L2_mag-rtn-burst_20221008_V01.cdf
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solo_L2_mag-rtn-burst_20221017_V01.cdf
solo_L2_mag-rtn-burst_20221018_V01.cdf
solo_L2_mag-rtn-burst_20221019_V01.cdf
solo_L2_mag-rtn-burst_20221020_V01.cdf
solo_L2_mag-rtn-burst_20221021_V01.cdf
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